

What is claimed is:

1. An apparatus capable of quantitative magnetic measurement of samples, each sample arranged in a predefined pattern and disposed in a sample holder, comprising:

a magnetic field source to apply a magnetic field to the sample, the magnetic field source defining a gap in which a sample holder is movably disposed;

a substantially flat magnetic field sensor to sense an induced magnetic moment from the sample and configured and arranged in a gradiometer configuration to substantially eliminate the contribution of the magnetic field source to the sensing, the magnetic field sensor having a sensing area substantially the same as the extent of each sample, the magnetic field sensor having an output to communicate output signals, the magnetic field sensor disposed substantially within the gap of the magnetic field source.